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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/392,722 09/09/99 AKAMATSU

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023850 MM91/0914
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EXAMINER

GRAYBILL, D	
ART UNIT	PAPER NUMBER

12

2814
DATE MAILED:

09/14/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/392,722

Applicant(s)

AKAMATSU ET AL.

Examiner

David E Graybill

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 11 July 2001.

2a) ☐ This action is FINAL.

2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 17-21, 25, 26 and 37-41 is/are pending in the application.

4a) Of the above claim(s) 17-21, 25, 26, 37 and 38 is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 39-41 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some * c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.

4) ☐ Interview Summary (PTO-413) Paper No(s). _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other:

Claims 37 and 38 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 11.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The amendment filed 9-9-99 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is the amendment to page 15, last line.

The amendment filed 12-26-00 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is the claim 39 limitation "through the first and second masks," and the

claim 41 limitation, "wherein the first and second soldering metal bumps essentially consist of Pb and Sn."

Applicant is required to cancel the new matter in the reply to this Office Action.

Claims 39-41 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The non-described subject matter is the claim 39 limitation, "through the first and second masks," and the claim 41 limitation, "wherein the first and second soldering metal bumps essentially consist of Pb and Sn."

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 39-41 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 39 there is insufficient literal antecedent basis for the limitation "the first and second masks."

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Behun (5147084) and Hideshima (5143865).

At column 3, line 63 to column 4, line 62, Behun teaches the following:

39. A method for fabricating an integrated electronic device having an electric connection connecting a first electrode of a first substrate with a second electrode of a second substrate, surfaces of the second electrodes having adhesive tendencies to molten metal, the method comprising the steps of: forming a first 18 and second 13 soldering metal bumps on the surfaces of the first 12 and second 17 electrodes by depositing second soldering metals through a mask, a melting temperature of the first soldering metal bump being higher than a melting temperature of the second soldering metal bump; aligning the first and second soldering metal bumps to each other, and then keeping both in contact with each other; and heating the first and second soldering metal bumps to melt the second soldering metal bump at a connection temperature lower than the melting temperature of the first soldering metal bump and solidifying the second soldering metal to form an electric connection between the first and second electrodes.

41. A method for fabricating an integrated electronic device according to 39, wherein the first and second soldering metal bumps essentially consist of Pb and Sn, wherein Pb is contained

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less in the first soldering metal bump than in the second soldering metal bump.

To further clarify the teaching of depositing the second soldering metals through a mask, as cited, Behun teaches that the second soldering metal is screened, and the use of a mask is inherent in a process of screening.

However, Behun does not appear to explicitly teach that the first electrode has repellant tendencies to molten metal, a first mask, or the following:

40. A method for fabricating an integrated electronic device according to 39, wherein the surfaces of the first and second electrodes are made of Al and Cu, Au, Ag or Sn, respectively.

Nonetheless, at column 1, lines 31-68; and column 2, lines 39-43, Hideshima teaches a process wherein an electrode 5 has repellant tendencies to molten metal, a mask, and wherein the surface of an electrode is made of Al (as disclosed at column 1, lines 57-68; and column 2, lines 39-43) or Cu. Moreover, it would have been obvious to combine the process of Hideshima with the process of Behun because it would provide first and second electrodes.

Applicant's amendment and remarks filed 7-11-01 are addressed in the rejection supra and are further addressed infra.

Applicant alleges that the amendment to page 15, last line, is supported by "original claim 23." This allegation is respectfully traversed because the original claim 23 limitation wherein the first metal layer is silver is not supported by the original disclosure of priority application 08/504,080.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any telephone inquiry of a general nature or relating to the status (MPEP 203.08) of this application or proceeding should be directed to the group receptionist whose telephone number is 703-308-1782.

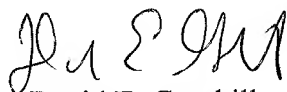
Any telephone inquiry concerning this communication or earlier communications from the examiner should be directed to David E. Graybill at (703) 308-2947. Regular office hours: Monday through Friday, 8:30 a.m. to 6:00 p.m.

The fax phone number for group 2800 is 703/305-3431.

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David E. Graybill
Primary Examiner
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D.G.
12-Sep-01